

WHAT IS CLAIMED IS:

1. A wheel speed calculation method wherein, to calculate wheel speed at the calculation timing of a given period based on a pulse signal provided by shaping the waveform of a detection signal of a wheel speed sensor (1,8), the wheel speed sensor including a rotor (2,9) with a plurality of detected elements rotating with wheel which is a controlled object;

when both rising and falling edges occur in the present calculation period, wheel speed VW is calculated as follows:

$$VW = [K \times \{Nu(n) + Nd(n)\}] / \{\Delta Tu(n) + \Delta Td(n)\}$$

when a rising edge does not occur although a falling edge occurs in the present calculation period, the value of VW1 or VW2, whichever is the lower, is selected as the wheel speed VW, VW1 and VW2 being calculated as follows:

$$VW1 = [K \times \{Nu(n-1) + Nd(n)\}] / \{\Delta Tu(n-1) + \Delta Td(n)\}$$

$$VW2 = [K \times \{1 + Nd(n)\}] / \{\Delta Tut + \Delta Td(n)\}$$

when a falling edge does not occur although a rising edge occurs in the present calculation period, the value of VW3 or VW4, whichever is the lower, is selected as the wheel speed VW, VW3 and VW4 being calculated as follows:

$$VW3 = [K \times \{Nu(n) + Nd(n-1)\}] / \{\Delta Tu(n) + \Delta Td(n-1)\}$$

$$VW4 = [K \times \{Nu(n) + 1\}] / \{\Delta Tu(n) + \Delta Tdt\}$$

when neither a rising edge nor a falling edge occurs in the present calculation period, a comparison is made between

the minimum value of VW5 to VW7 and the preceding wheel speed VW and the minimum value or the preceding wheel speed VW, whichever is the lower, is selected as the present wheel speed VW, VW5 to VW7 being calculated as follows:

$$5 \quad VW5 = [K \times \{1 + Nd(n-1)\}] / \{\Delta Tut + \Delta Td(n-1)\}$$

$$VW6 = [K \times \{Nu(n-1) + 1\}] / \{\Delta Tu(n-1) + \Delta Tdt\}$$

$$VW7 = (K \times 2) / (\Delta Tut + \Delta Tdt)$$

wherein $\Delta Tu(n)$ is the rising side speed calculation reference time between the instant at which the last rising edge of the pulse signal in the preceding calculation period occurs and the instant at which the last rising edge in the present calculation period occurs,

$\Delta Td(n)$ is the falling side speed calculation reference time between the instant at which the last falling edge of the pulse signal in the preceding calculation period occurs and the instant at which the last falling edge in the present calculation period occurs,

$Nu(n)$ is the number of occurrences of the rising edge within the rising side speed calculation reference time $\Delta Tu(n)$,

20 $Nd(n)$ is the number of occurrences of the falling edge within the falling side speed calculation reference time $\Delta Td(n)$,

ΔTut is the rising side speed calculation temporary reference time between the instant at which the last rising edge occurs and the present calculation timing when no rising edge occurs in the present calculation period,

ΔTdt is the falling side speed calculation temporary reference time between the instant at which the last falling edge occurs and the present calculation timing when no falling edge occurs in the present calculation period,

5 K is a constant determined in response to a tire to which calculation of the wheel speed is applied and the number of detected elements (2a, 9a) of a rotor (2, 9) of the wheel speed sensor (1, 8), and

10 $\Delta Tu(n-1)$, $\Delta Td(n-1)$, $Nu(n-1)$, and $Nd(n-1)$ are the value of the rising side speed calculation reference time $\Delta Tu(n)$, the value of the falling side speed calculation reference time $\Delta Td(n)$, the value of the number of occurrences $Nu(n)$, and the value of the number of occurrences $Nd(n)$ in the preceding calculation period respectively.

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2. A wheel speed calculation method as set forth in claim 1 calculates the wheel speed used for brake control.

20 3. A wheel speed calculation method as set forth in claim 2, the wheel speed VW is calculated in a control unit for the brake.